

Contamination to Gentrification?

Group 13: The Miaus

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Track A

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Problem & Motivation

Superfund sites are known to have severely decreased property values by its nearby neighborhoods due to their recognized health risks. With recent policies, once there is a cleaning, these areas may experience a resurgence of property price increases and even demographic changes, potentially contributing to gentrification (Banzhaf, 2007). We define gentrification as the quoted definition above. We hope to visit different sites, but for the midterm we hope to solely focus on North Ridge Estates in Oregon. How did median household incomes change in towns like Klamath Falls within 3 miles of the Superfund sites before, during, and after the site cleaning? We are defining our site as the neighboring town rather than the superfund parcel itself given our analysis on gentrification effects rather than the logistics towards cleanups. Did cleanup efforts contribute to gentrification, i.e., were there shifts in demographics as well as income in comparison to other neighborhoods/cities with similar economic statuses in the same city that were distant (≥ 3 miles) from these sites?

Data and Cleaning

Our primary data set for this project is the American Census Survey 5-year data. The granularity would be hard to describe, because you can alter it to have information for a specific state, county, city/borough. It has numerous columns, but we have mainly used median household income, total population, and ethnicities.

Visualization 1 and 2:

As I began the process of data cleaning, I was unsure of where to begin, but as I started my process of forming my visualization, I continued to go back to clean the data. Initially I simply renamed one of the columns, just to make the data frame more understandable to both myself and the audience. Afterwards I indexed into the table to convert the object type to ‘int’ rather than strings. However, after those two steps my line plot was still off, somehow median household income was in the negatives. I had realized that there were missing values that were replaced with negative values therefore I decided to filter the dataset to only include values that were greater than zero. I wanted to plot the neighboring town against another town with similar demographics (the control) so I filtered the data to solely include information on those two towns. As for my second visualization I had to also rename the columns because they were coded with id’s as well as iterate through the columns to turn them into an integer data type. I then filtered them based on the city of Klamath falls to observe change in count for ethnicities.

In regards to missing data, it ended up making up about 7% of our total data. Since we have a large data set I do not believe that dropping these rows will bias our data. I’d classify this data as type 1, data that we know are missing. I am able to identify which data is missing because it is imputed with the value -6666. Given that this is also a survey, there might have been a lack of data simply given the scarcity of responses. However, this brings back the question regarding bias. Are the missing values from rural areas? If so, it is possible that nonresponse bias is higher among low-income areas. There is also a popular case of this from 1936, in which the Literary Digest poll mispredicted the election results. It had two major flaws, one being selection bias, they were reaching out through automobile registrations and telephone directories. Those who owned cars and or telephones were generally wealthier. The second major flaw was nonresponse bias; only around 24% of folks returned the survey.

Visualization 3 and the Map:

Through the process of data cleaning, I followed a similar process to that of visualization 2. The only difference is that I filtered it to be the control group (Hermiston, OR). I also included

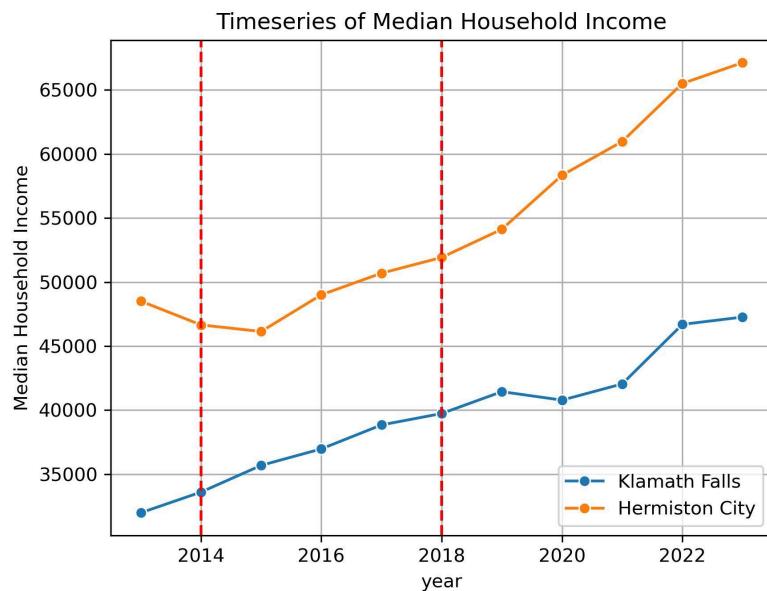
a red line indicating the time in which the superfund site cleanup process began and was completed. I also added in the total population column to add to the visualization.

For the map, I used the same techniques used in visualization 1, with converting the income to numeric. There was no missing data for median household income for this small subset of the data (one year, one county, and 21 census tracts), and so no steps had to be taken to account for this. The data from the census tracts shapefiles were taken from the TIGER website, and was merged with the ACS data directly on the GEOFID, from which it was plotted.

Initial Results and Visualizations

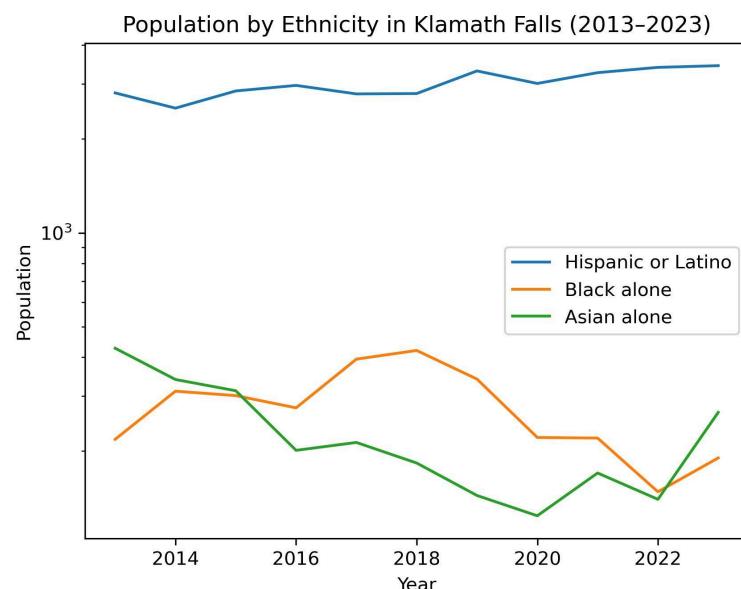
Visualization 1:

- We wanted to create a control and treatment group, so in this visualization we wanted to compare Klamath Falls (near the superfund site) to that of another town (distant from the superfund site). They both have similar demographics, but because there was already a gap prior to the superfund cleanup we agreed upon a difference in differences method to estimate the causal effect. However, given this plot we notice no statistically significant difference as they are still parallel. Though there is a small drop in 2020, we believe that is from the global pandemic rather than by the intervention (superfund site cleanup).



Visualization 2:

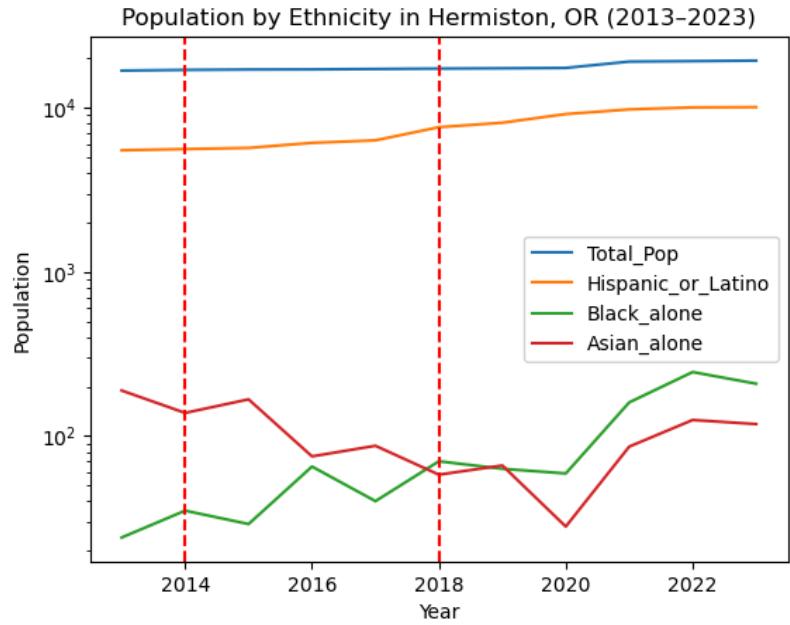
- In regards to looking at indicators of gentrification, one of the most significant factors include shifts in population. According to the National Neighborhood Indicators Partnership, "Most definitions of gentrification include a racial or ethnic component where white households replace households of color (Cohen & Pettit, 2019)." Given the large percentage



of white folks that make up the population, we have not included it in the visualization for the reason being it distorted the rest of the data.

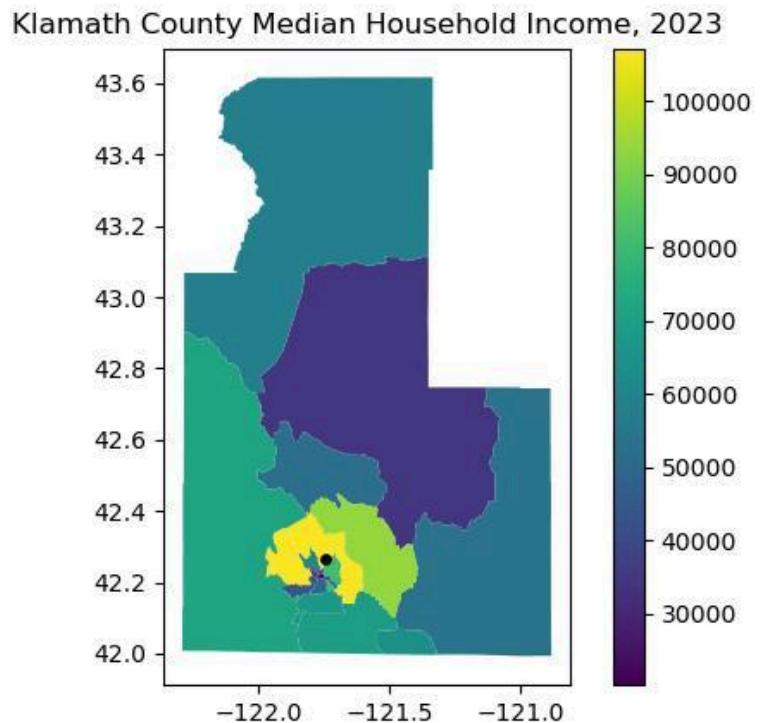
Visualization 3:

- We made this other population to use as a side-by-side comparison to visualization 2. This visualization includes the total population along with other ethnicities in Hermiston (control group). Here we see a similar pattern in regards to the Asian population, as it is declining through 2013 to 2020. However, for the Black population we see an increase, which we don't see in Klamath Falls. However, there seems to also be a similar trend for the Hispanic or Latino population.



Map:

- This map is a very zoomed-out exploration of the median household income in Klamath county, with the location of the superfund site indicated by the black dot around $-121.75, 42.3$. As of 2023, the median household income in the census tract containing the site is the highest in the county, and with no context of how that changed from the years before the superfund cleanup, there is not any information to be meaningfully gleaned from that. Moving forward, there will be a trimmed-down version of this map that will have far fewer census tracts, which will hopefully show us if we have a geographically granular enough dataset to work with census tracts in this location.



Progress Since Proposal

Since the proposal, we have slightly altered our research question. We have made sure to explicitly define our site for data analysis as well as what we define gentrification to be. We made sure to also consolidate our timeline to a more recent superfund site cleanup to have access to more data. We have also made sure to include our sources this time. Along with altering our question, we have cleaned and filtered our data to solely include our control and treatment cities. In total we have 3 charts, as well as one interactive map done.

Plan to Completion

- **Tasks we need to complete:**
 - Another interactive map that shows shifts in property values or possibly rent prices, since our data is more recent we will have access to the Zillow housing data
 - Visualization that shows a computed statistic (statistic tbd)
 - ArcGIS Storymap: we haven't begun this part of the project, so this will be something we will begin as soon as possible
 - Go to office hours for feedback
- **Timeline of Tasks:**
 - November 12: Begin ArcGIS storymap
 - November 18: Have another visualization done
 - November 25: Have interactive map done
 - December 1: Have storymap draft done
 - December 2-10: Go to office hours for feedback
 - December 2-15: Edit/alter any visualization, map, storymap

References

Banzhaf, H. S., & McCormick, E. (2007, January). *Moving beyond cleanup: Identifying the crucibles of environmental gentrification* (Working Paper No. 07 - 02). National Center for Environmental Economics, U.S. Environmental Protection Agency.
https://www.epa.gov/sites/default/files/2014-12/documents/moving_beyond_cleanup_idenitifying_the_crucibles_of_environmental_gentrification.pdf

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